

[REDACTED]

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**From:** [REDACTED]  
**Sent:** Thursday, 2 December 2021 4:55 PM  
**To:** [REDACTED] Section 7(2)(a)  
**Subject:** Fluoride - broad brush cost estimate  
**Attachments:** Fluoride costs estimates.xlsx

Hi,

Mark has asked me to lead the creation of a broad brush cost estimate for Fluoridation for our water supplies.

I have attached a spreadsheet originally from around 2010, but updated with current water demands and chemical costs.

It is divided into sections:

- Capital
- Chemical
- Operations
- Depreciation

Can you look over what I have in the Capital and Operations sections?

I've calculated the ongoing chemical costs based on Ixom's current pricing and water demands. Depreciation is calculated automatically as straightline over the life of the asset. I know this may not be the current methodology but it is a calculated value however it is worked out.

I am assuming that we are starting from scratch. NP is bulk HFA deliver while Inglewood is IBC and Oakura and Okato would be 200litre drums.

I am assuming duty standby dosing pumps, and at this stage one fluoride analyser per site. [REDACTED] I know you said you were either getting or had just got pricing for analysers. [REDACTED], you have suggested that we need two. Please confirm.

Section 7(2)(a)

Operational costs are based on what [REDACTED] told me way back in 2010. [REDACTED], this is where your thoughts come in particularly.

Section 7(2)(a)

I'm happy to get feedback on spreadsheet form or we sit together in a meeting room and agree. I'd like to get numbers confirmed before Xmas and I will set up a meeting where we can agree on final estimates.

[REDACTED] Section 7(2)(a)  
Principal Operations Engineer  
New Plymouth District Council | Liardet St | Private Bag 2025 | New Plymouth 4340  
Phone: [REDACTED] Mobile: [REDACTED]

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NPDC

be a  
**Wai**  
Warrior



[REDACTED]

---

**From:** Mark Hall <Mark.Hall@npdc.govt.nz>  
**Sent:** Tuesday, 3 May 2022 3:55 PM Section 7(2)(a)  
**To:** [REDACTED]  
**Cc:** [REDACTED]  
**Subject:** FW: Action Required: Community Water Fluoridation  
**Attachments:** CWF next steps letter New Plymouth District Council.pdf

**Importance:** High

Hi [REDACTED]

See letter from MoH (saved in ECM 8760832).

Looks like they intend to instruct us to fluoridate but have asked us to confirm information we provided. Can you review and confirm whether or not we need to amend our costs and timeframes for implementing this? I think we need to look at this in terms of the overall WTP master plan – David do you have any comment on this?

[REDACTED] – heads up this will be another project for your team. At this stage we advised it would take 2 years to get this up and running.

**Mark Hall**  
Three Waters Manager

New Plymouth District Council | Liardet St | Private Bag 2025 | New Plymouth 4340  
Phone: 06-759 6060 | Mobile: 0274 546 876  
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**From:** [REDACTED]\* [mailto:[REDACTED]@npdc.govt.nz]  
**Sent:** Tuesday, 3 May 2022 2:41 PM Section 7(2)(a)  
**To:** Mark Hall <Mark.Hall@npdc.govt.nz>  
**Cc:** [REDACTED] <[REDACTED]@npdc.govt.nz>  
**Subject:** FW: Action Required: Community Water Fluoridation  
**Importance:** High

For you thanks Mark.

Ngā mihi

[REDACTED]

---

**From:** Vi Vu [<mailto:Vi.Vu@health.govt.nz>] **On Behalf Of** Fluoride  
**Sent:** Tuesday, 3 May 2022 12:01 PM  
**To:** Craig Stevenson <[Craig.Stevenson@npdc.govt.nz](mailto:Craig.Stevenson@npdc.govt.nz)>  
**Subject:** Action Required: Community Water Fluoridation  
**Importance:** High

Kia ora Craig,

Please see attached a letter from the Director-General of Health on community water fluoridation. The Director-General of Health has requested further information from your local authority. Please provide your response to [fluoride@health.govt.nz](mailto:fluoride@health.govt.nz) by 29 June 2022.

If you have any questions, you can respond directly to this email.

Ngā mihi,  
Oral health team  
Ministry of Health

\*\*\*\*\*

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**From:** [redacted] <[redacted]@npdc.govt.nz>  
**Sent:** Monday, 16 May 2022 4:29 PM  
**To:** [redacted]; [redacted]  
**Cc:** [redacted]  
**Subject:** RE: Fluoridation  
**Attachments:** Fluoridation cost estimates 2022.xlsx

Section 7(2)(a)

Hi,

Spreadsheet attached. This file has two tabs, one being our own buildup with internal estimates including estimated operational costs, and the second being based on package plant estimates. I had included a modest sum for building works assuming a simple outdoor bunded slab with no cover. Given the uncertainty I then rounded up to the \$250k. At the time I felt the price for a simple slab would be thereabouts, but since then I have procured a simple pump plinth which was incredibly expensive for a very small but fiddly piece of concrete work.

Regards,

---

**From:** [redacted] [mailto:[redacted]@beca.com]  
**Sent:** Monday, 16 May 2022 1:48 PM  
**To:** [redacted] <[redacted]@npdc.govt.nz>; [redacted] <[redacted]@npdc.govt.nz>  
**Cc:** [redacted] <[redacted]@beca.com>  
**Subject:** RE: Fluoridation

Section 7(2)(a)

Hi [redacted] and [redacted],

As a follow-up to our meeting on Thursday afternoon about fluoridation at NP WTP, [redacted] wanted to clarify that \$250k might be about right for the process/mechanical/electrical elements only and that any building or civil costs would be additional to this sum.

I was wondering if you might like to share with us the breakdown for your estimate and we could review/comment on it, if that would be useful?

Kind regards,

-----Original Appointment-----

**From:** [redacted] <[redacted]@npdc.govt.nz>  
**Sent:** Tuesday, 10 May 2022 3:26 pm  
**To:** [redacted]  
**Subject:** Fluoridation  
**When:** Thursday, 12 May 2022 1:45 pm-2:45 pm (UTC+12:00) Auckland, Wellington.  
**Where:** Microsoft Teams Meeting

Section 7(2)(a)

Hi all,

We need to respond to MOH by the end of June about budget and timing for the fluoridation of the NP WTP.

[redacted] can share with Beca the assumptions he had to set up the \$250k budget he initially established, but this was without considering other further things related to the improvement plan. We will need to update this budget if

necessary as part of the improvement plan. Also, we initially asked for a two years timing to install the fluoridation, but we could justify an extension considering the overall program.

Let's discuss how we will proceed with this as part of the improvement plan.

Thanks,

---

## Microsoft Teams meeting

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**Join with a video conferencing device**

[npdc@m.webex.com](mailto:npdc@m.webex.com)

Video Conference ID: 134 221 312 2

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Sensitivity: General

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[REDACTED]

---

**From:** [REDACTED] <[REDACTED]@npdc.govt.nz> Section 7(2)(a)  
**Sent:** Wednesday, 6 July 2022 8:01 AM  
**To:** [REDACTED] Mark Hall; [REDACTED]  
**Cc:** [REDACTED]  
**Subject:** RE: Letter to Ministry of Health re Community Water Fluoridation

Hi all,

On Monday I re contacted Prominent Chemfeed to confirm the previous budget pricing he gave for the chemical dosing skids and for this to be based on a containerised or portacom solution. The containerised solution had been intimated in previous correspondence but no pricing indicated. I expect to have a response before CoB Thursday.

[REDACTED]

---

**From:** [REDACTED] Section 7(2)(a)  
**Sent:** Tuesday, 5 July 2022 8:16 PM  
**To:** Mark Hall <Mark.Hall@npdc.govt.nz>; [REDACTED]@npdc.govt.nz; [REDACTED] <[REDACTED]@npdc.govt.nz>  
**Cc:** [REDACTED]@npdc.govt.nz  
**Subject:** RE: Letter to Ministry of Health re Community Water Fluoridation

Thanks for this update.

---

**From:** Mark Hall  
**Sent:** Friday, 1 July 2022 3:47 pm  
**To:** [REDACTED]@npdc.govt.nz; [REDACTED]@npdc.govt.nz  
**Cc:** [REDACTED]@npdc.govt.nz; [REDACTED]@npdc.govt.nz Section 7(2)(a)  
**Subject:** FW: Letter to Ministry of Health re Community Water Fluoridation

Hi [REDACTED]

See below we will now need to take this to the next level in terms of a temporary dosing design. Are we able to determine what a temporary solution might be? While it may be temporary it does still need to comply with any safety standards such as storage and separation of chemicals etc.

[REDACTED] – fyi depending on what this looks like it may require a PM. Either way we will need a Demand entered in P3M.

**Mark Hall**  
Three Waters Manager

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---

**From:** Ben Volz [<mailto:Ben.Volz@health.govt.nz>] **On Behalf Of** Fluoride  
**Sent:** Friday, 1 July 2022 1:27 PM  
**To:** Mark Hall <[Mark.Hall@npdc.govt.nz](mailto:Mark.Hall@npdc.govt.nz)>  
**Subject:** RE: Letter to Ministry of Health re Community Water Fluoridation

Kia Ora Mark,

Thank you for your letter. Having discussed your letter with our water engineer here at the Ministry we have a few further questions for you to inform the Director-General's decision making.

You note in your letter that if NPDC were required to implement fluoridation in the main NP supply prior to mid-2026 a temporary installation would be required. Are you able to provide information on:

- How long it could take to get a temporary installation in place
- What the cost of a temporary installation might be (ie: we assume this might differ from your previous estimates of the costs of a permanent solution).
- Any further information on the feasibility of a temporary installation or different options you could consider (eg. containerised solution).

We acknowledge the difficulty of providing this information with a high level of certainty given the current environment across the construction sector and the lack of time to undertake further engineering work. However any information you can provide by COP Thursday 7 July would be much appreciated.

Nga Mihi

Ben Volz  
Senior Advisor  
Public Health Agency  
Ministry of Health

---

**From:** Mark Hall <[Mark.Hall@npdc.govt.nz](mailto:Mark.Hall@npdc.govt.nz)>  
**Sent:** Tuesday, 28 June 2022 10:35 am  
**To:** Fluoride <[Fluoride@health.govt.nz](mailto:Fluoride@health.govt.nz)>  
**Subject:** FW: Letter to Ministry of Health re Community Water Fluoridation

Hi

Please see letter attached.

**Mark Hall**  
Three Waters Manager

New Plymouth District Council | Liardet St | Private Bag 2025 | New Plymouth 4340  
Phone: 06-759 6060 | Mobile: 0274 546 876  
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**From:** [REDACTED] <[REDACTED]@npdc.govt.nz]>  
**Sent:** Monday, 27 June 2022 3:12 PM  
**To:** Mark Hall <[Mark.Hall@npdc.govt.nz](mailto:Mark.Hall@npdc.govt.nz)>  
**Subject:** Letter to Ministry of Health re Community Water Fluoridation

Section 7(2)(a)

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[REDACTED]

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**From:** Mark Hall  
**Sent:** Tuesday, 12 July 2022 1:44 PM  
**To:** [REDACTED]@chemfeed.co.nz Section 7(2)(a)  
**Cc:** [REDACTED]; [REDACTED]@chemfeed.co.nz  
**Subject:** FW: ProMinent Fluoride Saturator Systems  
**Attachments:** image004.png; image005.png; image006.png; image007.png

Hi Mark

I've had a follow up email today from MOH who want us to provide information on the feasibility and cost of a temporary "containerised" solution for adding fluoride to the New Plymouth supply by Thursday this week. I was just talking to Deane who gave me your name.

Are you able to provide confirmation that a containerised solution is feasible and a budget estimate for this by Thursday?

Thanks for your help.

Regards

**Mark Hall**  
Three Waters Manager

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Phone: 06-759 6060 | Mobile: 0274 546 876  
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**From:** [REDACTED]  
**Sent:** Tuesday, 12 July 2022 11:24 AM  
**To:** Mark Hall <Mark.Hall@npdc.govt.nz>  
**Subject:** FW: ProMinent Fluoride Saturator Systems

Sent from my Galaxy

----- Original message -----

**From:** [REDACTED]@chemfeed.co.nz>  
**Date:** 11/07/22 18:20 (GMT+12:00)  
**To:** [REDACTED]@npdc.govt.nz> Section 7(2)(a)  
**Subject:** Re: ProMinent Fluoride Saturator Systems

Evening [REDACTED] I'll check how this one is going, regards [REDACTED]

Sent from my iPhone

On 11/07/2022, at 5:15 PM, [REDACTED] <[REDACTED]@npdc.govt.nz> wrote:

Hi [REDACTED],

Do you have any update on this request? MoH are chasing us

Thanks

[REDACTED]

---

**From:** [REDACTED] Section 7(2)(a)  
**Sent:** Monday, 4 July 2022 8:58 AM  
**To:** [REDACTED] <[REDACTED]@chemfeed.co.nz>  
**Subject:** RE: ProMinent Fluoride Saturator Systems  
**Importance:** High

Hi [REDACTED],

We've had more correspondence with the Ministry of Health, as well as having done more work on the future of our Water Treatment plant looking forward to meeting demand over the coming 30 years.

The latest letter received last week, MoH are pushing to get fluoride installed ASAP while we have identified a need to relocate aspects of our WTP including chemical dosing in the next 5 years. We are therefore looking towards a temporary fluoride dosing solution to cover the next 5 years or so. We may be able to incorporate the temporary dosing equipment into a future permanent solution, but that is not forefront of the mind at the moment.

Your email below details out budget pricing for dosing skids. You mention also the possibility of a containerised solution. This was specifically mentioned for our smaller sites but not for New Plymouth.

Please can you confirm if a containerised skid arrangement, using HFA, would be appropriate for New Plymouth? We would need to be able to dose daily flows of 27.5 - 40MLD at a target dose of 7mg/L.

Would you be able to confirm budget pricing for this as a containerised option?

MoH have given us until 7 July (this coming Friday!) to respond with more details including costings for a temporary installation. I realise this is an incredibly short timeframe but it what we were given and I hope you can help.

Regards,

[REDACTED]

Section 7(2)(a)

[REDACTED]

Principal Operations Engineer  
New Plymouth District Council | Liardet St | Private Bag 2025 | New Plymouth 4340  
Phone: 06 759 6065      Mobile: [REDACTED]  
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<image004.png>

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**From:** [REDACTED] [[mailto:\[REDACTED\]@chemfeed.co.nz](mailto:[REDACTED]@chemfeed.co.nz)]  
**Sent:** Monday, 24 January 2022 5:15 PM

To: [REDACTED] <[REDACTED]@npdc.govt.nz>

Subject: ProMinent Fluoride Saturator Systems Section 7(2)(a)

Good afternoon [REDACTED]. Trust you had a pleasant weekend.

For the Okato, Oakura & Inglewood our 5kg bottle Sodium Fluoride System ( 5 – 250) would be best option. Budget pricing for the basic equipment package would be [REDACTED], plus GST  
It doesn't include installation , building work or fluoride analyser.  
If space is an issue inside the existing plant we can provide the systems installed ready to go inside a 10 " shipping container or Portacom style small building .

Below is a typical system  
<image005.png>

To make this system more efficient and cost effective the 5kg bottle could be replaced with a vacuum loader to suit 25kg bags of Sodium Fluoride . The 25 kg bags are considerably cheaper than using 5kg bottles plus less operator involvement. The base price for this would change but it's something to keep in mind further down the track that could be explored.

For New Plymouth site our vacuum loading dry feeder system maybe a bit small (recommend flow range 15 – 40MLD.) so an HFA system may be the option. Careful consideration would be required to meet operational needs as mentioned in your email.

Section 7(2)(b)(ii) and 7(2)(h)

Budget price for basic HFA equipment (supply only )would be as follows .  
5m3 self-bunded tank - [REDACTED] + concrete slab, level equipment ( instruments), safety shower, tanker loading facility, HSNO inspection & signage.  
Dosing skid would be around [REDACTED] + controls depending on what is specified . Similar to above this does not include a fluoride analyser.

When more details are available, we would be pleased to look at these site again with the view to provide detailed system pricing.  
I will phone you tomorrow [REDACTED] , have a good evening.

Kind Regards,

[REDACTED] Technical Sales Mobile: [REDACTED] Section 7(2)(a)  
Chemfeed | 6a Enterprise Drive, Henderson, Auckland 0612 | Tel: 09 837 6075  
2/340 Flaxton Road, Rangiora 7400 | Tel: 03 313 8188 | [www.chemfeed.co.nz](http://www.chemfeed.co.nz)

---

From: [REDACTED] <[REDACTED]@npdc.govt.nz>

Sent: Thursday, 20 January 2022 8:29 am Section 7(2)(a)

To: [REDACTED] <[REDACTED]@chemfeed.co.nz>

Subject: RE: ProMinent Fluoride Saturator Systems & Analysers

Hi [REDACTED],

Thanks for getting in touch. You will no doubt be fielding a lot of enquiries with the Ministry of Health requesting information from all water suppliers on the anticipated costs of providing fluoridation to all water supplies. As you are no doubt aware, the decision has been placed with MoH but at this stage they have made no specific direction.

I have been building up prices from components, but for small plants this may not be the most effective solution. I have also assumed HFA, but talking with [REDACTED], I am aware that they are



dosing sodium fluoride at their small plants. I also feel that my estimates are too low and I'd be keen to get some comparison against packaged plants. I have current prices for supply of HFA but not sodium fluoride. [REDACTED] indicated it is more expensive than HFA although there are fewer H&S issues with sodium fluoride.

I would be pleased to receive your budget pricing for package plants of otherwise for our four water supplies with details summarised below. Any other comparison information you could offer between HFA and Sodium fluoride would be appreciated.

Okato –

Average flow 0.5MLD, current peak flow 0.7MLD and a maximum permitted abstraction of 1 MLD. The WTP is small and confined and there is now specific provision for fluoridation equipment

Oakura –

Average Daily flow 0.7MLD, current peak flow 1.5MLD. Maximum anticipated future peak demand 3MLD (this is unlikely to be reached for 30 – 50 years) This WTP has just been upgraded and part of that upgrade included setting aside space for fluoridation equipment. Stabbings were also provided in pipework for injection points

Inglewood –

Average Daily flow 1.7MLD, current peak flow 2.4MLD. Maximum anticipated peak flow 3MLD This is an older plant but the original drawings show that space was allowed for fluoridation equipment. I think that polymer dosing equipment currently occupies the area originally set aside, but the WTP building is relatively large with space available in the plant room. However, the plant room can be damp with condensation. It may be appropriate to consider a separate enclosed room for fluoride dosing equipment

New Plymouth –

Average daily flow 30MLD, current peak flow 45MLD. Maximum peak flow is being worked on but expected to be around 50 – 55MLD. We previously dosed HFA at this site. The tank and dosing equipment has been removed. The HFA was inside the building and immediately next to lime storage and lime dosing. Our WTP lead doesn't want any future HFA storage to be inside the building and doesn't want the HFA dosing in close proximity to any alkali.

Regards,

[REDACTED]

Section 7(2)(a)

Principal Operations Engineer

New Plymouth District Council | Liardet St | Private Bag 2025 | New Plymouth 4340

Phone: 06 759 6065

Mobile: [REDACTED]

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<image006.png>

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**From:** [REDACTED] [[mailto:\[REDACTED\]@chemfeed.co.nz](mailto:[REDACTED]@chemfeed.co.nz)]

**Sent:** Wednesday, 19 January 2022 4:19 PM

Section 7(2)(a)

**To:** [REDACTED]

**Subject:** ProMinent Fluoride Saturator Systems & Analysers

Afternoon [REDACTED] trust you were able to have some time off over the holiday break. I called earlier but you were in a meeting . I'll try to call later on .

With the Ministry of Health's recent decision to issue directions on Fluoridation of all public water supplies (over 500 population) from mid-2022, we have put together some options on the different size systems we can offer.

Our package Fluoride systems can be installed in a small container or cabin for easy relocation at your water treatment plant.

The ProMinent 5-250 Saturator System is suitable for a plant flowrate of up to 3MLD when using the 5kg jars. But this can be increased to a plant flow 15MLD if we change out the bottle loader to a vacuum loader system.

As you can see from the attached layout drawing it will easily fit in a small container or portable building.

We can also supply complete HFA systems if required.

Let me know if you need any further information. We can supply P&ID's and room layout drawings as required.

Kind Regards,

Section 7(2)(a)

██████████ Technical Sales Mobile: ██████████

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2/340 Flaxton Road, Rangiora 7400 | Tel: 03 313 8188 | [www.chemfeed.co.nz](http://www.chemfeed.co.nz)

<image007.png>

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**From:** Mark Hall  
**Sent:** Wednesday, 13 July 2022 2:37 PM Section 7(2)(a)  
**To:** [REDACTED]  
**Cc:** [REDACTED]  
**Subject:** RE: [Chemfeed Quote#301322 2] Quote v2 - Chemfeed #301322 - New Plymouth WTP - HFA System

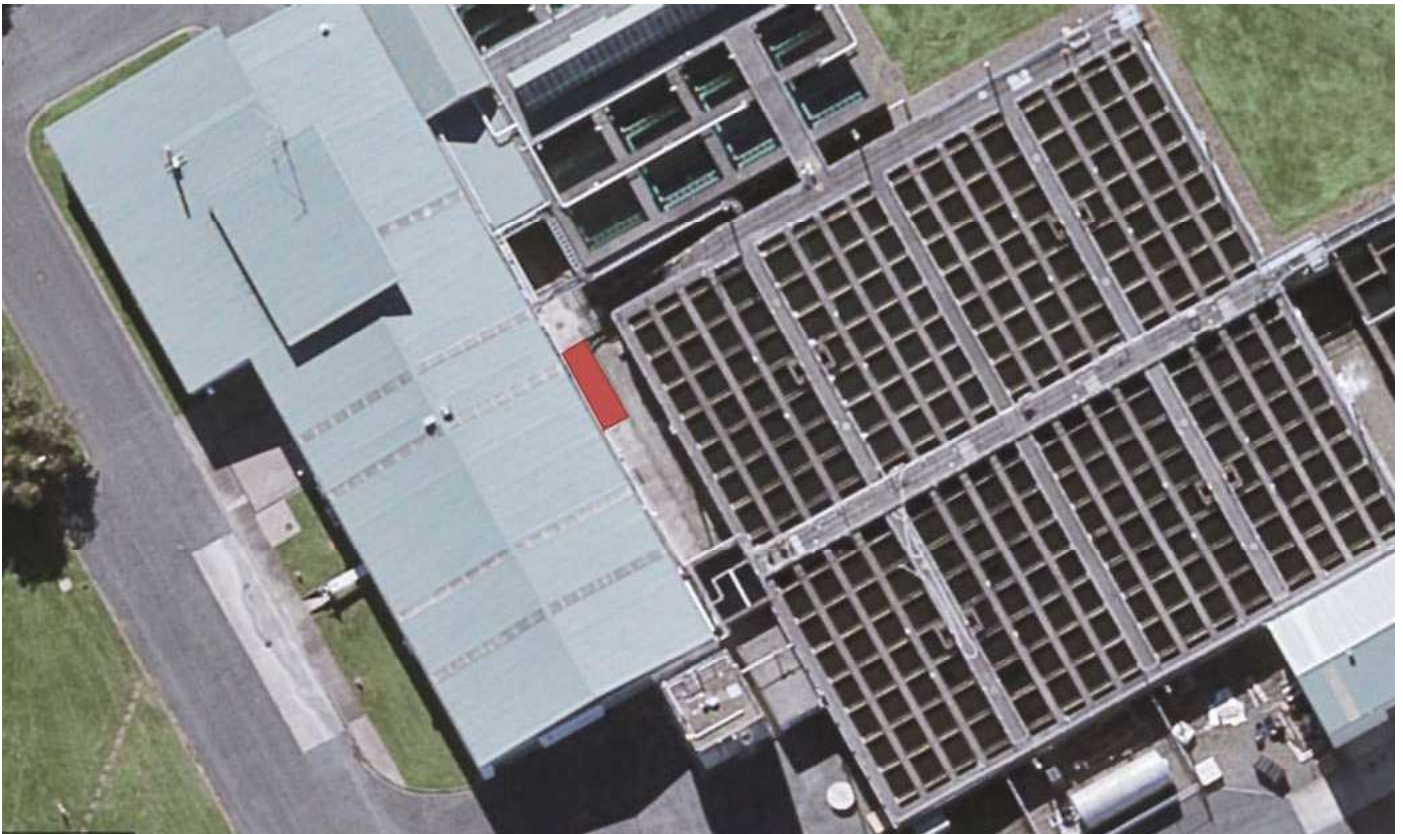
Hi Mark

This is enough for me to be able to respond to the MoH (confirming its possible and a budget price).

Thanks for this.

Below I've attached a screen shot of the proposed location – the red rectangle. Its located next to the old fluoride dosing tank and equipment which is in the building to the left. We'd plumb it up though the wall.

Once MoH give us an instruction to fluoridate [REDACTED] will be in touch to work out the details.



Thanks for your help with this.

**Mark Hall**  
Three Waters Manager

New Plymouth District Council | Liardet St | Private Bag 2025 | New Plymouth 4340  
Phone: 06-759 6060 | Mobile: 0274 546 876  
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---

**From:** [redacted] [mailto:[redacted]@chemfeed.co.nz]

Section 7(2)(a)

**Sent:** Wednesday, 13 July 2022 11:34 AM

**To:** Mark Hall <Mark.Hall@npdc.govt.nz>

**Cc:** [redacted] <[redacted]@npdc.govt.nz>; [redacted] <[redacted]@chemfeed.co.nz>

**Subject:** RE: [Chemfeed Quote#301322 2] Quote v2 - Chemfeed #301322 - New Plymouth WTP - HFA System

Hi Mark,

We originally priced up the porta comb for use with our Fluoride Saturator System as it would be used to store the Fluoride as well. All that we put in this one for HFA is the dosing skid, control panel and potentially the Fluoride Analyser. You don't have to have it – it's just an option.

Probably a better option would be to build the dosing skid using the cabinet below. This can be butted up directly to the HFA tank and is suitable for outdoor use. If you give us an overview of the location we can sort out a layout drawing for you.

As you don't currently have any Fluoride Analysers in your region we would be keen for you to use the ProMinent DACb Fluoride analyser. It is pretty much the standard analyser for use with Fluoride in Australia and is approved for use with various regions over there. It also comes with dual validation options if required.



Kind Regards,

[redacted] Mobile: [redacted]

Chemfeed | 6a Enterprise Drive, Henderson, Auckland 0612 | Tel: 09 837 6075

2/340 Flaxton Road, Rangiora 7400 | Tel: 03 313 8188 | [www.chemfeed.co.nz](http://www.chemfeed.co.nz)

---

**From:** Mark Hall <[Mark.Hall@npdc.govt.nz](mailto:Mark.Hall@npdc.govt.nz)>

Section 7(2)(a)

**Sent:** Wednesday, 13 July 2022 11:15 AM

**To:** [redacted] <[redacted]@chemfeed.co.nz>

**Cc:** [redacted] <[redacted]@npdc.govt.nz>; [redacted] <[redacted]@chemfeed.co.nz>

**Subject:** RE: [Chemfeed Quote#301322 2] Quote v2 - Chemfeed #301322 - New Plymouth WTP - HFA System

Hi Mark

Thank you for this. I've discussed with the team the feasibility of this. given the potential location for this we wouldn't have room for the portacom. We would use the plant PLC for control. We would also like to use some standardised instruments such as the level sensors. We'll sort this detail out later if MoH instruct us to fluoridate.

For clarification:

What is stored in the portacom?

Is this to protect the PLC and/or other instruments and or the bulk storage tank or is it also need for the dosing skid?  
Or is the cabinet the dosing skid comes in weather proof?

Thanks

**Mark Hall**

Three Waters Manager

New Plymouth District Council | Liardet St | Private Bag 2025 | New Plymouth 4340

Phone: 06-759 6060 | Mobile: 0274 546 876

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---

**From:** [REDACTED] [mailto:[REDACTED]@chemfeed.co.nz]

Section 7(2)(a)

**Sent:** Tuesday, 12 July 2022 5:00 PM

**To:** Mark Hall <[Mark.Hall@npdc.govt.nz](mailto:Mark.Hall@npdc.govt.nz)>

**Cc:** [REDACTED] <[REDACTED]@npdc.govt.nz>; [REDACTED] <[REDACTED]@chemfeed.co.nz>

**Subject:** [Chemfeed Quote#301322 2] Quote v2 - Chemfeed #301322 - New Plymouth WTP - HFA System

Hi Mark,

Pricing attached for the storage and dosing equipment required to dose HFA at New Plymouth WTP. This system would need a pad for the building and also the 1000L HFA Storage Tank. We have allowed for duty/standby dosing pumps. Let me know if you only need duty only.

I expect you will control this system from your plant PLC, but we have given you the option of a package control panel - although some PLC's & HMI's have horrendous lead times at the moment.

Normally we recommend that the system is flow paced from the main plant flow meter. We also recommend a separate flow switch to ensure dosing doesn't occur if the flow meter is faulty.

For tanker deliveries you will also require a wash down hose and safety shower within 7m of the fill point. If you can let me know if you need any site installation I can add it to the quote. We normally only carry out the mechanical install and commissioning as most councils have a preferred electrical contractor they use who are familiar with their plants.

As part of the commissioning process we would lock our dosing pumps to the maximum dose rate required at max plant flow + 5%.

Data sheets attached. Let me know if you need anything else.

Regards,

[REDACTED] Section 7(2)(a)

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2/340 Flaxton Road, Rangiora 7400 | Tel: 03 313 8188 | [www.chemfeed.co.nz](http://www.chemfeed.co.nz)

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**From:** Mark Hall  
**Sent:** Tuesday, 12 July 2022 5:16 pm  
**To:**  
**Subject:** FW: [Chemfeed Quote#301322 2] Quote v2 - Chemfeed #301322 - New Plymouth WTP - HFA System  
**Attachments:** Quote-NEW-PLY-DC-301322.PDF; Chemfeed NZ Limited - 3.6 x 2.95 Multi-Purpose - PLAN.pdf; Fluoride Analyser - DACb with Filter and Gemu Rotameter.pdf; Flyer-dulcometer-fluoride-analyser-nz.pdf; 1000 HFA Dosing PID.pdf; 1000 HFA Dosing Skid.pdf; 1000 Ltr Bunded.pdf; Flyer-gamma-x-en.pdf

Would we be able to run this off an existing plant PLC or would we need a new one?

Looks like he allowed in this price for one.

**Mark Hall**  
Three Waters Manager

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Phone: 06-759 6060 |  
[www.newplymouthnz.com](http://www.newplymouthnz.com) | [Facebook](#) | [Twitter](#)

**From:**  
**Sent:** Tuesday, 12 July 2022 5:00 PM  
**To:** Mark Hall  
**Subject:** [Chemfeed Quote#301322 2] Quote v2 - Chemfeed #301322 - New Plymouth WTP - HFA System

section 7(2)(b)(ii) section 7(2)(h)

Hi Mark,

Pricing attached for the storage and dosing equipment required to dose HFA at New Plymouth WTP. This system would need a pad for the building and also the 1000L HFA Storage Tank. We have allowed for duty/standby dosing pumps. Let me know if you only need duty only.

I expect you will control this system from your plant PLC, but we have given you the option of a package control panel - although some PLC's & HMI's have horrendous lead times at the moment.

Normally we recommend that the system is flow paced from the main plant flow meter. We also recommend a separate flow switch to ensure dosing doesn't occur if the flow meter is faulty.

For tanker deliveries you will also require a wash down hose and safety shower within 7m of the fill point. If you can let me know if you need any site installation I can add it to the quote. We normally only carry out the mechanical install and commissioning as most councils have a preferred electrical contractor they use who are familiar with their plants.

As part of the commissioning process we would lock our dosing pumps to the maximum dose rate required at max plant flow + 5%.

Data sheets attached. Let me know if you need anything else.

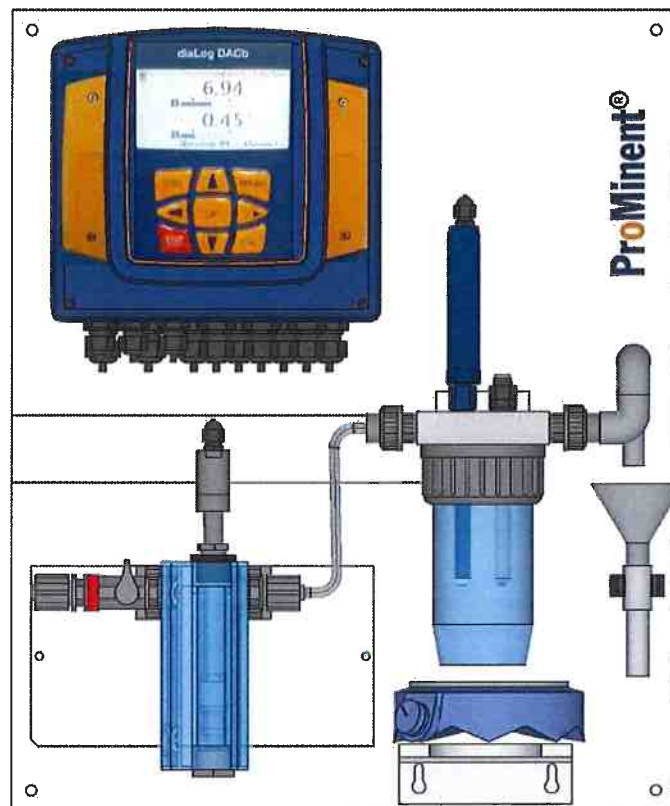
Regards,





# ProMinent Dulcometer Fluoride Analyser

Reagent Free Fluoride Monitoring



## Measured Variable, Fluoride in Drinking Water

### Measurement Principle and application

The DULCOMETER fluoride meter is a potentiometric meter which uses an ion selective electrode (ISE) and a reference electrode to deliver a measurement signal in mV. The expertise of the newly developed fluoride ISE lies in the physical-chemical characteristics of the LaF3 crystals and the ion electrolytes which permit long-term stable and continuous measurement without additional use of special conditioning chemicals. Photometric measurement-based calibration is necessary only when commissioning and at occasional intervals. The typical and only use of our fluoride meter is for continuous monitoring at waterworks in which fluoride is metered for the prevention of tooth decay. Installation conditions for the fluoride electrode.

### Technical Data

Measurement range	0.05... 10 mg/l fluoride	
pH range:	5.5... 8.5	
Temperature range:	0-35°C	
Max operating pressure	1 bar	
Part Number:	Fluoride Monitor mounted on panel with REFR	PA56003465
	Dual Channel Fluoride Monitor with REFR	PA56003466

**Note:** The maximum admissible operating for the following mounted measurement equipment is 2 - bar.

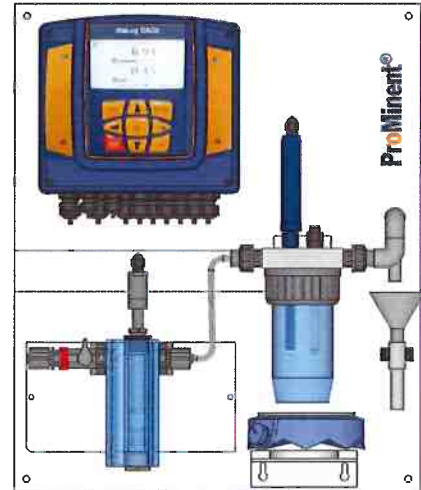
# ProMinent Dulcometer Fluoride Analyser

## Fully-mounted Fluoride Monitor

For quick and easy installation, our fluoride meter is supplied ready-mounted on a PE panel. The following components are included:

- FLEP 010 SE fluoride sensor
- Reference electrode
- Pt 100 SE temperature sensor
- 4-20 mA FVP1 measurement transducer
- DLG IV inline probe housing for electrodes
- DACb diaLog fluoride monitor, with display of fluoride concentration and temperature, with automatic temperature compensation, 0/4... 20 mA output for measured variable, with pause control input, alarm and two threshold value relay outputs, (90-253 VAC)
- Magnetic stirrer with magnetic stirring rod for stirring sample water during calibration
- PVC pipework with ball stop/adjustment valve, rotameter with sample water connector

**All parts are ready mounted on a white 600 x 500 mm PE panel**



**PA56003465 - with REFR Standard Supply**

Note: c/w air-break, REFR reference electrode, 25m 8x5 sample line, and 1 x 1/2" BSP to 8x5 PVC adaptor.

## Double Validation Unit

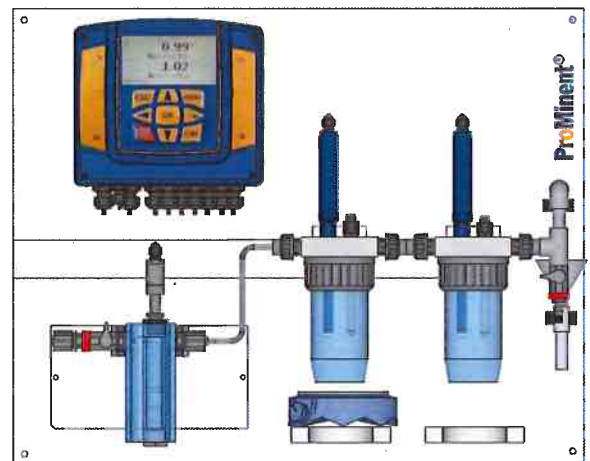
Using the same sensors as for the single measurement stations, the dual measurement station can be used to give an alarm output if the 2 measured variables differ more than a present amount.

This means that the unit can be used where there is a requirement for double validation. A 0/4...20 mA output is available for each channel of the 2 channel diaLog instrument.

A single magnetic stirrer is provided as standard as normally one channel is calibrated at a time. A second magnetic stirrer is available as an option.

Both options with the REFR or the PHEN reference electrodes with flowing junctions are available.

**All come pre-mounted on a 750mm wide x 600mm high panel, fully wired.**



**PA56003466 - with REFR Standard Supply**

Note: c/w air-break, REFR reference electrodes, 25m 8x5 sample line, and 1 x 1/2" BSP to 8x5 PVC adaptor.

# Solenoid-Driven Metering Pump gamma/ X

## gamma/ X – the proven best-seller intelligently extended



### Capacity range 2.3 – 45 l/h, 25 – 2 bar

The new solenoid-driven diaphragm metering pump gamma/ X is user-friendly and has an outstandingly long service life, just like its predecessor. An ingenious solenoid control measures the back pressure and protects the system from overload. This technology makes a pressure sensor superfluous, meaning that operating safety can be significantly increased: no additional parts come into contact with the feed chemical, there are no additional

sealing surfaces and no electronic components come into contact with the feed chemical. Whether the metering volume fluctuates or hydraulic failures affect the metering process – the gamma/ X keeps everything at your fingertips.

It independently ensures a trouble-free metering process and should the pump ever need maintenance its service module draws attention to this.

### Your benefits

- Simple adjustment of the capacity directly in l/h
- Direct input of the required final concentration in concentration mode for volume-proportional metering tasks
- Integrated pressure measurement and display for greater safety during commissioning and in the process
- Capacity adjustment range 1:40,000
- Virtually wear-free solenoid drive, overload-proof and economical
- Suitable for continuous micro-metering from approx. 1 ml/h, thanks to the regulated solenoid drive

### Field of application

- Can be integrated into automated processes and used in all industries.
- The pump can work as a control unit with the timer, for example in cooling water treatment.

# Solenoid-Driven Metering Pump gamma/ X

gamma/ X – the proven best-seller intelligently extended

## Technical Data

Pump type	Delivery rate at max. back pressure			Stroke rate Strokes/min	Connection size o Ø x l Ø mm	Suction lift m WC	Shipping weight	
	bar	l/h	ml/stroke				PP, NP, PV, TT kg	SS kg
<b>gamma/ X</b>								
GMXa 1602	16	2.3	0.19	200	6 x 4	6.0**	3.6	4.1
GMXa 1604	16	3.6	0.30	200	6 x 4	5.0**	3.6	4.1
GMXa 0708	7	7.6	0.63	200	8 x 5	4.0**	3.7	5.0
GMXa 0414	4	13.5	1.13	200	8 x 5****	3.0**	3.7	5.0
GMXa 0220	2	19.7	1.64	200	12 x 9	2.0**	3.7	5.0
GMXa 2504	25	3.8	0.32	200	8 x 4***	4.0**	4.9	5.5
GMXa 1009	10	9.0	0.75	200	8 x 5	3.0**	5.1	6.5
GMXa 0715	7	14.5	1.21	200	8 x 5****	3.0**	5.1	6.5
GMXa 0424	4	24.0	2.00	200	12 x 9	3.0**	5.1	6.5
GMXa 0245	2	45.0	3.70	200	12 x 9*****	2.0**	5.2	7.0
<b>gamma/ X metering pumps with self-bleeding dosing head without bypass</b>								
GMXa 1602	10	1.5	0.08	200	6 x 4	1.8**	3.6	–
GMXa 1604	10	2.2	0.13	200	6 x 4	1.8**	3.6	–
GMXa 0708	7	5.6	0.48	200	8 x 5	1.8**	3.7	–
GMXa 0414	4	12.2	1.00	200	8 x 5	1.8**	3.7	–
GMXa 0220	2	18.0	1.45	200	12 x 9	1.8**	3.7	–
GMXa 1009	10	6.6	0.50	200	8 x 5	1.8**	5.1	–
GMXa 0715	7	13.0	1.08	200	8 x 5	1.8**	5.1	–
GMXa 0424	4	22.0	1.60	200	12 x 9	1.8**	5.1	–

gamma/ X metering pumps with dosing heads for higher-viscosity media have a 10 – 20 % lower capacity and are not self-priming with all feed chemicals. G 3/4-DN 10 connector with d 16-DN 10 hose nozzle.

- \* The given performance data represents guaranteed minimum values, calculated using water as the medium at room temperature.
- \*\* Suction lift with a filled dosing head and filled suction line, with a self-bleeding dosing head with air in the suction line
- \*\*\* with stainless steel design 6 mm connector width
- \*\*\*\* with stainless steel design 12 mm connector width
- \*\*\*\*\* with stainless steel design DN 10

All data refers to water at 20 °C.



# Solenoid-Driven Metering Pump gamma/ X

## gamma/ X – the proven best-seller intelligently extended

### Materials in Contact With the Medium

	Dosing head	Suction/pressure connector	Ball seat	Seals	Balls
PPT	Polypropylene	PVDF	PVDF	PTFE	Ceramic
NPT	Clear acrylic	PVDF	PVDF	PTFE	Ceramic
PVT	PVDF	PVDF	PVDF	PTFE	Ceramic
TTT	PTFE with carbon	PTFE with carbon	Ceramic	PTFE	Ceramic
SST	Stainless steel material no. 1.4404	Stainless steel material no. 1.4404	Ceramic	PTFE	Ceramic

Metering reproducibility:  $\pm 2\%$  when used according to the instructions in the operating instructions

Permissible ambient temperature:  $-10\text{ }^{\circ}\text{C}$  to  $+45\text{ }^{\circ}\text{C}$

Mean power consumption: 25/30 W

Degree of protection: IP 66, NEMA 4X, insulation class F

### Scope of supply

Metering pump with mains cable, connector kit for hose/tube connector as per table.



**From:** Media Enquiries \*  
**Sent:** Wednesday, 6 July 2022 4:39 pm  
**Subject:** Response to local media enquiries email Wednesday 6 July 2022

Good afternoon,  
We responded to the following media enquiries today.

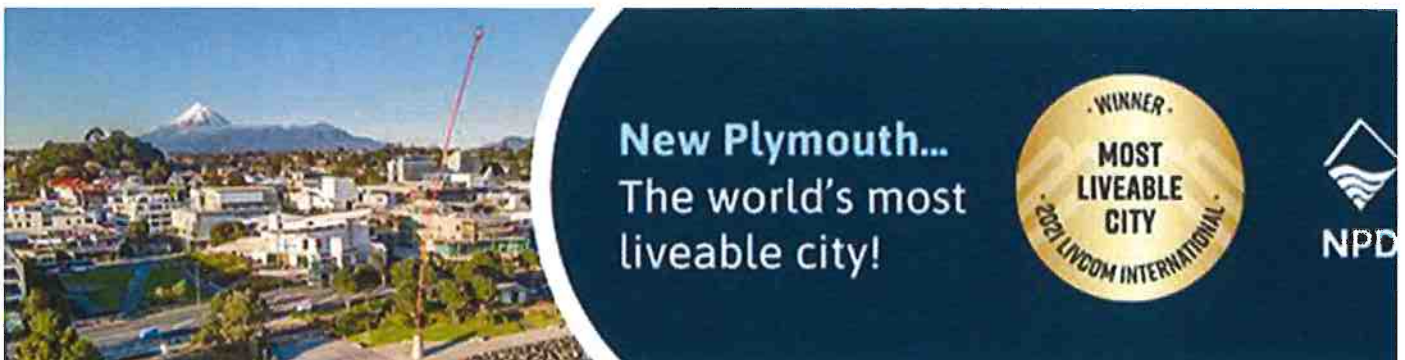
**Outside scope of LGOIMA request**

- Helen Harvey, Taranaki Daily News asked about the timing and costs to implement infrastructure needed as a result of the directive from the Ministry of Health to introduce fluoride to our water supply. We have not had a directive from the MOH yet but are looking into infrastructure needed and that changes at the NP wastewater treatment could cost around \$250,000. The cost for this would be discussed during either the next Annual Plan or 10-year Plan depending on when we get directive from the ministry. It would also influence the timing of any works.

**Outside scope of LGOIMA request**

Public Engagement Specialist

New Plymouth District Council | Liardet St | Private Bag 2025 | New Plymouth 4340 |  
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• **section 7(2)(a)**

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**From:**  
**Sent:** Friday, 4 February 2022 2:40 pm  
**To:**  
**Subject:** RE: ProMinent Fluoride Saturator Systems

We have a supply agreement with Ixom

---

**From:**  
**Sent:** Friday, 4 February 2022 2:19 PM  
**To:**  
**Subject:** RE: ProMinent Fluoride Saturator Systems

), looking into this . Which supplier do you currently use for the chemical?

Kind Regards,

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2/340 Flaxton Road, Rangiora 7400 | Tel: 03 313 8188 | [www.chemfeed.co.nz](http://www.chemfeed.co.nz)

---

**From:**  
**Sent:** Friday, 4 February 2022 12:02 pm  
**To:**  
**Subject:** RE: ProMinent Fluoride Saturator Systems

I just received pricing back from our chemical supplier and they lead me to a question for clarification.

They supply 5kg canisters of Sodium Fluoride but not 25kg bags, if we wanted 25kg bags they would supply Sodium Silicofluoride which they say is less hazardous and also yields more fluoride per kg of chemical.

When you have talked about 25kg bags are you still talking about Sodium Fluoride or Sodium Silicofluoride? Can your systems handle dosing Sodium Silicofluoride?

Thanks

New Plymouth District Council | Liardet St | Private Bag 2025 | New Plymouth 4340

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From: **section 7(2)(a)**  
Sent: Monday, 24 January 2022 5:15 PM  
To:  
Subject: ProMinent Fluoride Saturator Systems

Good afternoon Trust you had a pleasant weekend.

For the Okato, Oakura & Inglewood our 5kg bottle Sodium Fluoride System ( 5 – 250) would be best option. Budget pricing for the basic equipment package would be **section 7(2)(b)(ii) section 7(2)(h)**  
It doesn't include installation , building work or fluoride analyser.  
If space is an issue inside the existing plant we can provide the systems installed ready to go inside a 10 " shipping container or Portacom style small building .

Below is a typical system



To make this system more efficient and cost effective the 5kg bottle could be replaced with a vacuum loader to suit 25kg bags of Sodium Fluoride . The 25 kg bags are considerably cheaper than using 5kg bottles plus less operator

involvement. The base price for this would change but it's something to keep in mind further down the track that could be explored.

For New Plymouth site our vacuum loading dry feeder system maybe a bit small (recommend flow range 15 – 40MLD.) so an HFA system may be the option. Careful consideration would be required to meet operational needs as mentioned in your email.

Budget price for basic HFA equipment (supply only) would be as follows .

**section 7(2)(b)(ii) section 7(2)(h)**

5m<sup>3</sup> self-bunded tank + concrete slab, level equipment ( instruments), safety shower, tanker loading facility, HSNO inspection & signage.  
Dosing skid would be around controls depending on what is specified . Similar to above this does not include a fluoride analyser.

When more details are available, we would be pleased to look at these site again with the view to provide detailed system pricing.

I will phone you tomorrow ( have a good evening.

Kind Regards,

Chemfeed | 6a Enterprise Drive, Henderson, Auckland 0612 | Tel: 09 837 6075  
2/340 Flaxton Road, Rangiora 7400 | Tel: 03 313 8188 | [www.chemfeed.co.nz](http://www.chemfeed.co.nz)

**From:** **section 7(2)(a)**  
**Sent:** Thursday, 20 January 2022 8:29 am  
**To:**  
**Subject:** RE: ProMinent Fluoride Saturator Systems & Analysers

Thanks for getting in touch. You will no doubt be fielding a lot of enquiries with the Ministry of Health requesting information from all water suppliers on the anticipated costs of providing fluoridation to all water supplies. As you are no doubt aware, the decision has been placed with MoH but at this stage they have made no specific direction.

I have been building up prices from components, but for small plants this may not be the most effective solution. I have also assumed HFA, but talking with I am aware that they are dosing sodium fluoride at their small plants. I also feel that my estimates are too low and I'd be keen to get some comparison against packaged plants. I have current prices for supply of HFA but not sodium fluoride. ndicated it is more expensive than HFA although there are fewer H&S issues with sodium fluoride.

I would be pleased to receive your budget pricing for package plants of otherwise for our four water supplies with details summarised below. Any other comparison information you could offer between HFA and Sodium fluoride would be appreciated.

Okato –

Average flow 0.5MLD, current peak flow 0.7MLD and a maximum permitted abstraction of 1 MLD. The WTP is small and confined and there is now specific provision for fluoridation equipment

Oakura –

Average Daily flow 0.7MLD, current peak flow 1.5MLD. Maximum anticipated future peak demand 3MLD (this is unlikely to be reached for 30 – 50 years) This WTP has just been upgraded and part of that upgrade included setting aside space for fluoridation equipment. Stabbings were also provided in pipework for injection points

Inglewood –

Average Daily flow 1.7MLD, current peak flow 2.4MLD. Maximum anticipated peak flow 3MLD This is an older plant but the original drawings show that space was allowed for fluoridation equipment. I think that polymer dosing equipment currently occupies the area originally set aside, but the WTP building is relatively large with space available in the plant room. However, the plant room can be damp with condensation. It may be appropriate to consider a separate enclosed room for fluoride dosing equipment

New Plymouth –

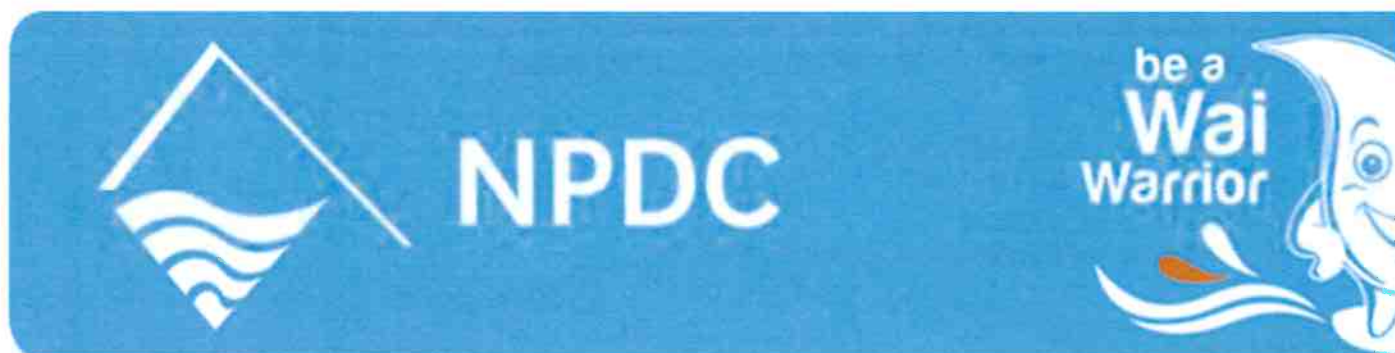
Average daily flow 30MLD, current peak flow 45MLD. Maximum peak flow is being worked on but expected to be around 50 – 55MLD. We previously dosed HFA at this site. The tank and dosing equipment has been removed. The HFA was inside the building and immediately next to lime storage and lime dosing. Our WTP lead doesn't want any future HFA storage to be inside the building and doesn't want the HFA dosing in close proximity to any alkali.

Regards,

New Plymouth District Council | Liardet St | Private Bag 2025 | New Plymouth 4340

F

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**From:** L

**Sent:** Wednesday, 19 January 2022 4:19 PM

**To:**

**Subject:** ProMinent Fluoride Saturator Systems & Analysers

st you were able to have some time off over the holiday break. I called earlier but you were in a meeting . I'll try to call later on .

With the Ministry of Health's recent decision to issue directions on Fluoridation of all public water supplies (over 500 population) from mid-2022, we have put together some options on the different size systems we can offer. Our package Fluoride systems can be installed in a small container or cabin for easy relocation at your water treatment plant.

The ProMinent 5-250 Saturator System is suitable for a plant flowrate of up to 3MLD when using the 5kg jars. But this can be increased to a plant flow 15MLD if we change out the bottle loader to a vacuum loader system. As you can see from the attached layout drawing it will easily fit in a small container or portable building.

We can also supply complete HFA systems if required.

Let me know if you need any further information. We can supply P&ID's and room layout drawings as required.



Kind Regards,

Chemfeed | 6a Enterprise Drive, Henderson, Auckland 0612 | Tel: 09 837 6075  
2/340 Flaxton Road, Rangiora 7400 | Tel: 03 313 8188 | [www.chemfeed.co.nz](http://www.chemfeed.co.nz)



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Tomal Polymer Preparation Packages | Powder Feeder Packages – Fluoride, Soda Ash, PAC & Lime | Gas  
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Worksafe Approved Chemical Storage Tanks |

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• **section 7(2)(a)**

**From:**  
**Sent:** Thursday, 3 February 2022 1:31 pm  
**To:**  
**Subject:** RE: Fluoride question

Hi

HFA is 1 tonne and there is no cost for Sodium fluoride on the contract so I have asked to provide me with a cost.

**section 7(2)(b)(ii) section 7(2)(h)**

I will let you know.

Kind Regards

**From:**  
**Sent:** Thursday, 3 February 2022 1:21 PM  
**To:**  
**Subject:** Fluoride question

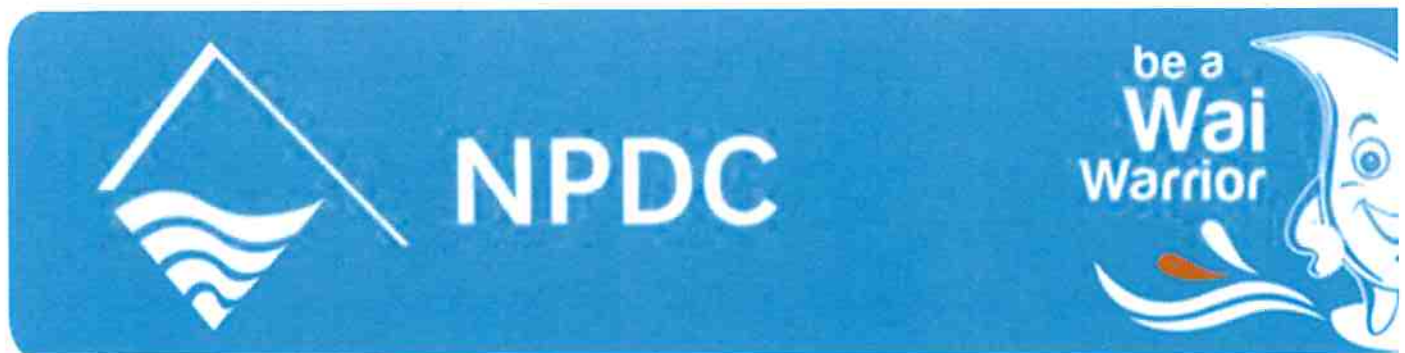
I have been getting some budget pricing for Fluoride dosing gear at our WTP's just to make sure we are in the right ball park.

The supplier (Chemfeed) have suggested sodium fluoride for our smaller WTPs. Either in 5kg bottles or 25kg bags. They can't really do NP with Sodium fluoride as they only have kit that goes upto 40MLD and we exceed that in current peak demand.

Any thoughts on sodium fluoride? Do we have any costs from Ixom for Sodium Fluoride. I know this is what STDC use. says it is expensive compared to HFA but it alleviates a lot of the HSE risk with HFA

New Plymouth District Council | Liardet St | Private Bag 2025 | New Plymouth 4340

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• **section 7(2)(a)**

**From:**  
**Sent:** Monday, 29 November 2021 9:14 am  
**To:**  
**Subject:** RE: Fluoride Analysers

Appreciate all the info. The units look good. At this point in time we are only looking at budgetary pricing. There is no project in place to purchase and install but it will happen in the next 12 months or so I'm guessing. We will be back in touch for further info when we the 'GO' button gets pushed.

Regards

New Plymouth District Council | Liardet St | Private Bag 2025 | New Plymouth 4340 | Ph 06-759 6060  
Direct dial | [www.newplymouthnz.com](http://www.newplymouthnz.com) | [Facebook](#) | [Twitter](#)



**From:** C  
**Sent:** Friday, 26 November 2021 7:43 AM  
**To:**  
**Subject:** RE: Fluoride Analysers

Some more info on the Fluoride analyser from ECD :

For the CA900 analyzer, you will just need reagents on a monthly basis. You may be able to find the reagent chemicals locally.

If you are competing against HACH and SWAN, I would suggest the CA900 analyzer. See attached. See below for pricing.

The cheapest solution would be to just get the T80 and 2 x S80 sensor, one for F and the other for pH. However, the process would need to be consistent with flow and concentrations.

Simplest method would be the CA900 method. As this is measuring the total fluoride in the process.

Our confidence level is high when it comes to fluoride. The fluoride is our #1 selling sensor and OEM for the company.

Budgetary pricing below for everything you need :

Part# : CA900-2A-1111 Fluoride analyser

Price :

Description : CA900 Fluoride analyser w/ reagent container fast loop reservoir 0-1ppm

Part# : 2010199-20 → probably can find locally,.. price TBA

Price :

**section 7(2)(b)(ii) section 7(2)(h)**

Description : Reagent CA900 Fluoride analyser CA900, 20L (1 unit per month)

Calibration solutions 1ppm & 10ppm can be bought locally → price TBA

---

Part# : 2000171 Yearly Maintenance kit

Price :

Description : Kit, tubing, annual maintenance + quarterly sample & pinch valves CA900

---

**Recommended Yearly spares :**

Part# : 2005163.VIT = Electrode Fluoride ION peek

Price :

**Spare parts :**

Part# : 2000142-1 = reaction cell motor assy CA900 titrator

Price :

**section 7(2)(b)(ii) section 7(2)(h)**

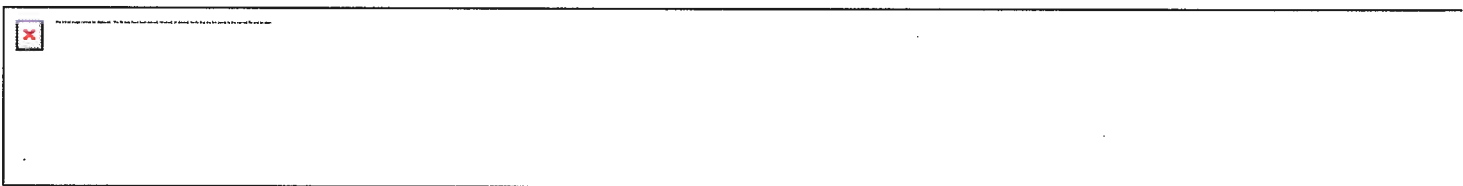
Part# : 2000151-1 = pump assy sample titrator

Price \$

**Give me a call if you require more info**

Regards

M  
P



---

**From:**

**Sent:** Thursday, 25 November 2021 9:29 PM • **section 7(2)(a)**

**To:**

**Subject:** RE: Fluoride Analysers

We currently have 2x Fluoride analysers (T80+ S80) at [redacted] in an extremely challenging application and they are performing well.

Luckily your application is straight forward. If the PH is between 5-8 you don't need a PH probe for compensation. All these sensors are Digitalized so they calibrate with a touch of the button. Some training will be provided and I'll be in the area if they need assistance.

Concerning the confidence level,.. We don't sell gear that we believe are unsuitable or create short/long term issues.

We only sell products with excellent quality, and good backup support from the supplier,.. like the Teltherm support and service we give you now.

Documentation attached and budgetary pricing below.

T80 single channel  
S80 fluoride sensor  
Polish kit fluoride sensor =  
Calibration solution 500ml = (6 month shelf life) → probably can find locally smaller quantities but need to do some investigation.

Delivery : 3-4 weeks

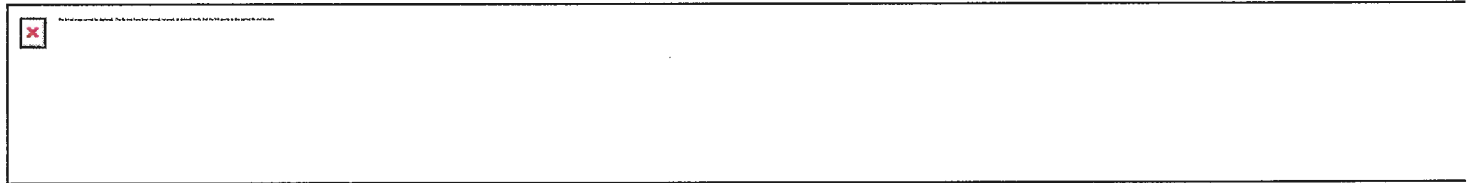
Alternatively we have the CA900 Fluoride Analyzer = Complete solution, no install needed. Just connect hoses and provide power.

To send you an accurate quote, please let me know how you want to install the probe and the PH values and I'll send you an accurate price. If you can also tell me how many units you are looking for ?  
We can also mount everything on a plate (in a cabinet) with power supply, outputs,.. anything you want,.. just let me know.  
We can even install the units on site to give a complete system from 1x supplier.

Happy to visit you somewhere next week and discuss this further.

Regards

M  
P

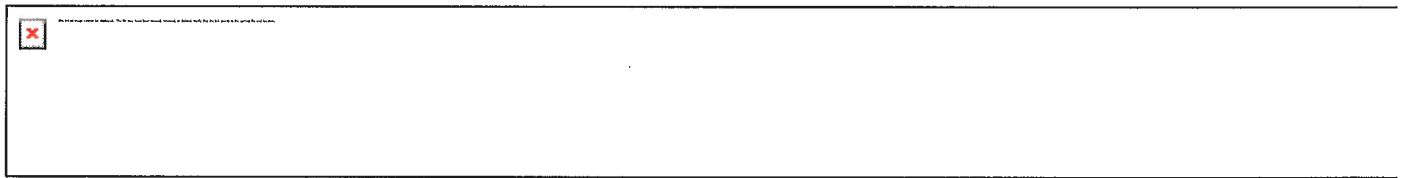


---

**From:** section 7(2)(a) [\[Z\]](#)  
**Sent:** Thursday, 25 November 2021 11:11 AM  
**To:**  
**Subject:** Fluoride Analysers

We've recently been alerted to the fact that fluoride dosing is going to be imposed on us. With that in mind we will be getting asked to provide associated costs. We will therefore be looking to purchase Fluoride analysers so I wondered what you could provide for us in the way of likely costs and delivery times for your analysers and what your confidence level is on the instruments in terms of reliability, ease of calibration, ongoing consumable costs etc.

Regards



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# Fluoride Ion Sensors



ELECTRO-CHEMICAL DEVICES

## Features

- Model S80 Universal Style Sensors
- Multiple materials of construction
- Integral Signal Conditioner
- Replaceable Electrode Cartridge
- Available with pH compensation

## Benefits

- Insertion, Immersion or Valve Retractable Service
- 316 Stainless Steel, Titanium, Hastelloy
- Noise free transmission
- Simple and Economical Service
- Wide range of service from 2 pH to 8 pH



## Description

The Model S80 universal sensors provide a stable and economical platform for the in line measurement of pH, ORP, Specific Ion, Dissolved Oxygen, Conductivity or Resistivity. The Model S80 is an insertion or immersion style sensor for use in pipe Tees or on the end of a Stand Pipe for immersion into a tank or pond. The Model S80 is also available as a valve retractable design allowing insertion or removal of the sensor into a pipe without interrupting the process flow. Both sensor designs use easily replaceable electrode cartridges. ECD offers several ion selective electrode cartridges suitable for continuous online measurement.

The Fluoride Ion Selective Electrode cartridge develops a millivolt potential proportional to the concentration of free fluoride ions in the measured solution. The model S80 Fluoride Ion sensors are used with the Model T80 Transmitter with its dual channel and pH compensation capabilities. These analyzers will measure free fluoride ions from 0.02 ppm to 2,000 ppm in the optimum pH range of 5-8 pH. Outside this pH range, large errors will occur in the acid range and small errors will occur in the alkaline pH ranges.

In acidic solutions fluoride ions react to form hydrofluoric acid, HF,  $pK_a = 3.2$ , at 3.2 pH half of the available fluoride ions are HF and half are the measureable  $F^-$ . This characteristic can be compensated for by adding a pH sensor into the measurement

loop. The T80 analyzer will report the total Fluoride ion concentration by measuring the available free fluoride and adjusting the value in accordance with the measured pH value. Hydroxide ions,  $OH^-$ , interfere with the fluoride measurement, 10 hydroxide ions generate the same signal as 1 fluoride ion. This accounts for an error of 1.7 ppb at pH 8, 17 ppb at pH 9 and 0.17 ppm at pH 10.

Fluoride ions will complex with aluminum, silicon, iron (+3), and other polyvalent cations as well as hydrogen and these fluoride ion complexes will not be "seen" by the sensor. If any of these chemicals are present in the measured solution the analyzer will report a lower concentration than the true value.

The sensor is calibrated in two standard solutions differing in concentration by a factor of 10, i.e. 10 ppm and 100 ppm. This calibration sets the slope of the electrode, mV/decade and a zero potential for the sensor. In many cases the process solution's ionic strength and pH value differ widely from the calibration solutions characteristics. This will affect the zero potential of the fluoride sensor but not the slope causing an offset in the measurement. The offset is eliminated by performing a process standardization. When the sensor has stabilized in the process solution take a grab sample of the process and determine the fluoride ion concentration and the adjust the analyzer to read this laboratory determined value.



# Fluoride Ion Sensors

## Specifications

### Model S80 Fluoride Sensors

Combination electrode cartridge with a Lanthanum Fluoride measurement cell and a single junction, KCl/AgCl, reference electrode

### Electrode Slope

54 ± 5 mV per decade of concentration change

### Measurement Range

Fluoride: 0.02 to 2,000 ppm

pH: 2 to 8 pH

### Temperature Range

0° C to 80° C (32° F to 176° F)

### Pressure Range

0 - 50 psig (0 - 3.5 bar)

### Response Time

T90 in 10 seconds

### Electrode Life

6 to 12 months

### Interfering ions

Hydroxide, 0.1 selectivity (10 OH<sup>-</sup> = 1 F<sup>-</sup>)

### Wetted Materials

PEEK, epoxy, LaF crystal, PTFE, 316 SS, Viton O-Ring

### Process Connections

S80 Insertion: 3/4" MNPT compression fitting

S80 Valve Retractable: 1" MNPT Ball Valve

### Model T80 Transmitter

General purpose, 1/2 DIN, NEMA 4X, 110/220 VAC, 24 VDC or 4-20 mA loop powered, CE Marking, single or dual channel, (1) or (2) 4-20 mA outputs, optional (3)

Alarm Relays 250 VAC 3 amp, MODBUS RTU (standard) or HART 7, Auto ranging display, ppb →

ppm → ppthousand

Part No.	Model and Product Description
S80-00-0002-0100-078	S80 Fluoride, F <sup>-</sup> insertion style sensor with 3/4" 316 SS compression fitting, 316 SS body, 3/4" Diameter. x 10" length, 10 ft cable
S80-00-0002-0300-078	S80 Fluoride, F <sup>-</sup> insertion style sensor with 3/4" 316 SS compression fitting, 316 SS body, 3/4" Diameter. x 10" length, 30 ft cable
S80-01-0131-0110-078	S80 Fluoride, F <sup>-</sup> Valve Retractable Style with 1" Ball Valve Assembly, 316 SS body, 3/4" Diameter x 17" length, 10 ft cable
S80-01-0131-0310-078	S80 Fluoride, F <sup>-</sup> Valve Retractable Style with 1" Ball Valve Assembly, 316 SS body, 3/4" Diameter x 17" length, 30 ft cable
T80-10-21-00-1	Model T80 Single Channel Transmitterr, 110/220 VAC, (1) 4-20 mA outputs, (3) Alarm Relays, UM
T80-11-21-20-1	Model T80 Dual Channel Transmitterr, 110/220 VAC, (2) 4-20 mA outputs, (3) Alarm Relays, UM

Part No.	Spare Parts and Accessories Description
2005063.VIT	Fluoride Ion Electrode, PEEK body, dbl junction Teflon Ref, 0.02-2,000 ppm, 0°-80°C
2010400	Fluoride Ion Calibration Solution, 50% TISAB II, 1.0 ppm
2010401	Fluoride Ion Calibration Solution, 50% TISAB II, 10.0 ppm
2010431	Fluoride Ion Calibration Solution, 50% TISAB II, 100 ppm
2000250-1	Polishing Strip Kit, abrasive cleaning strips for Ion electrodes
S80-00-0002-0100-010	S80 pH, insertion style sensor with 3/4" 316 SS compression fitting, 316 SS body, 3/4" Diameter. x 10" length, 10 ft cable with General Purpose pH electrode (for pH compensated measurement)
2005103.VIT	pH electrode cartridge, fluoride resistant, PEEK body, dbl junction Teflon Reference

Specifications subject to change without notice.

### Represented by:

### Electro-Chemical Devices

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Fax: +1-714-695-0057

email: sales@ecdi.com

web: www.ecdi.com







## Model T80 Universal Transmitter

### The ECD 6 Point Advantage

- 1 Universal Transmitter:** single or dual channel, measures pH, ORP, DO, Specific Ion, Turbidity, Conductivity or Resistivity
- 2 Graphic LCD Display:** Easy to Read Graphical and Numerical Information
- 3 Simple Menu Structure:** Intuitive, Easy to navigate and Configure
- 4 Use with ECD Digital Intelligent Sensors** that are factory calibrated sensors and store data
- 5 4-20 mA output with MODBUS RTU and Alarm Relays:** Flexible configurations for all applications
- 6 HART® communication**

## Description

The **ECD Model T80 Universal Transmitter** is a single or dual channel transmitter designed for the continuous measurement of pH, ORP, pION, Dissolved Oxygen, Turbidity, Conductivity or Resistivity in a general purpose industrial environment. The Model T80 transmitter digitally communicates with any ECD Model S80 Intelligent Sensor, automatically configuring the transmitter's menus and display screens to the measured parameter. The same transmitter can be used for any of the measurements, i.e. plug an S80 Conductivity Sensor into a Model T80 pH transmitter and it will automatically reconfigure into a conductivity transmitter. There is no longer any need to inventory multiple instrument types, the one Model T80 transmitter will automatically configure to any of the listed measurements.

## SENSORS

The Model S80 Intelligent Sensors facilitate two way communication with the Model T80 transmitters. The type of sensor, identity and serial number are stored in the sensor's memory along with calibration registers. The Model S80 sensors are calibrated at the factory so they are ready to use when connected to a Model T80 transmitter. The Model S80 sensors are waterproof and submersible with all internal components epoxy encapsulated inside the 3/4" O.D. housing. The Model S80 sensors use the same field proven, easily replaceable electrodes as the Model S10 and S17 sensors saving time and money. A digital converter option is available for the Model T80 transmitter to allow the use of non-digital sensors. The digital converter is only available on line powered instruments.

## DISPLAY

The Model T80 Transmitter features a large easily viewed LCD display. Loop powered instruments have Black lettering on a Grey background, while 100-240 VAC and 24 VDC powered instruments have Blue lettering on a White background when the LED backlight is on. The Model T80 display is easily switched between the single and dual channel display modes. It has three



## Model T80 Universal Transmitter

Main Display screens; the Data Screen, the Millivolt Screen and the Graphical Display screen. The Data Screen displays the measurement type, the measured value with units, the % milliamp output of the 4-20 mA channel and the temperature. The mV Screen displays the measurement type, the raw millivolt signal from the sensor, the % milliamp output of the 4-20 mA channel and the temperature. The Graphical Screens display the measurement type, the measured value with units and a graphical representation of the % milliamp output. Three graphical styles are available; a Trend line, a Bar graph or a Gauge. The status of alarm relays, energized/de-energized is displayed on transmitters with relays.

## MENU

Menu navigation is accomplished using membrane switch buttons. Soft keys display the function associated with each button. Pressing any of the buttons twice within 2 seconds activates the Model T80 soft key menus. The primary selections are the Calibration menu, Configuration menu, Info Screens and Simulate menu.

## CALIBRATION

Model S80 sensors come precalibrated from the factory. Field calibrations are easily performed with the Model T80. The Calibration menu includes the Auto Cal function, a two point calibration, the Standardize function, a single point calibration or the Manual Calibration, where previously determined Offset and Slope values are entered manually into the Model T80 transmitter.

## CONFIGURATION

The Configuration menus allow the Model T80 transmitter's Display and Output functions and the Model S80 sensor's characteristics to be configured or adjusted. Display screens include the Hold function, Graphical Display Style, Back Light and Contrast adjustments, Labels/Tags for naming the transmitter, Password Protection and a Factory Default reset. Output screens include setting the addresses for MODBUS or HART® outputs, setting the 4-20 mA Range and fault settings and configuring the Alarm Relays.

## INFO

The Info screens provide Transmitter and Sensor Information. The transmitter screens display the Name, Power, Serial#, Firmware version and the output configuration. The sensor screens display the Name, Part #, Serial # and stored Calibration data.

## SIMULATE

The Simulate Menu allows the input and output signals to be simulated. The outputs are easily tested by entering a 4-20 mA output value or energizing and de-energizing a relay. The Ramp function cycles the signal across the configured 4-20 mA range, i.e. the transmitter generates a signal from 0 pH to 14 pH and back to 0 pH activating relays and generating a 4-20 mA output. The cycle time and the duration are adjustable allowing sufficient time for an individual to walk to the control room to verify the output.

## POWER SUPPLY and OUTPUTS

The Model T80 transmitter is available as a loop powered (single channel only), a 24 VDC or a 100/240 VAC powered transmitter. The loop powered version is available with an optional HART® output. The line powered instruments have one 4-20 mA output per channel and MODBUS RTU. Available options include HART® communication and an Alarm Relay package. The (B) relays can be configured as Alarm (set point) relays, timer activated relays or Fault relays.



**HART**  
COMMUNICATION PROTOCOL



# CA900 Fluoride Analyzer

## The ECD **6** Point Advantage



ELECTRO-CHEMICAL DEVICES

- 1 Compact all in one measurement system**, conditions the sample to measure the Fluoride concentration.
- 2 ISE based Fluoride Measurement** provides a wide measurement range, 0 to 200 using economical, easily replaceable electrode cartridges.
- 3 Ionic Strength adjusted and compensated measurement** for accurate total Fluoride concentration.
- 4 Auto Calibration** at user defined internals.
- 5 Reliable Design – Touchscreen Interface**  
User-friendly menus and configurations, two separate compartments (Electronic and Hydraulics Liquids).
- 6 Cost effective Low Maintenance Cost**  
Low reagent consumption and easily replaceable electrode cartridges.



## Description

The ECD CA900 Fluoride Analyzer is an all in one analyzer for the continuous measurement of fluoride concentration in aqueous media. Applications include: drinking water effluent, industrial waste water, semi-conductor manufacturing and waste water discharge compliance.

The CA900 Fluoride Analyzer are easy to start up and use, simply connect the sample, waste and reagent lines and then power up the factory calibrated analyzer. Wall mounting hardware is standard but an optional benchtop stand is also available. Accessing information or customizing an analysis routine are easily accomplished with the simple, user friendly menu structure and large color touch screen interface.

The analyzer has two separated enclosures with lockable doors. The top enclosure, called the ELECTRICAL enclosure, includes the main power supply, the controller PCB assembly, and the touch screen interface. The bottom enclosure, called the LIQUIDS enclosure, includes all the components involved in the sample and reagent flow, mixing, and measurement.

The fluoride measurement is based on ECD industrial grade ion-selective electrode technology. The analyzer mixing chamber contains ECD fluoride ion and pH electrodes for the measurement. The analyzer uses TISAB reagent for an ionic

strength adjustment to the sample to be measured, which breaks weak complexes formed with fluoride and certain metals such as aluminum or Iron (+3), to provide the fluoride concentration measurement. Additionally, the analyzer utilizes a pH compensation technique to provide accurate fluoride measurement in varying pH ranges. The CA900 Fluoride Analyzer has a configurable automatic calibration feature utilizing fluoride calibration standards that can be programmed for routine calibration cycles.

The CA900 Fluoride Analyzers is powered by 100 – 230 VAC, provides (4) 4 to 20 mA outputs, (4) configurable relays, serial output and can be web enabled for remote access.

The ECD CA900 is easy to start up and maintain. First connect the Sample feed line, reagent lines and Drain line to the analyzer. Mount the sulfide and pH sensors in the flow cell. Next connect the two outputs, S<sup>-2</sup> and pH and supply power, a switched 110/220 VAC line. Prime the peristaltic pumps and start the measurement cycle. The touch screen display and 4-20 mA outputs will indicate the total sulfide and the neutralized pH value. A digital display indicates the Sulfide measurement and the 4-20 mA output values are captured in the measurement cycle and displayed until the next measurement cycle.

## Specifications

### Principle of Operation

Sequential sampling, Fluoride Selective Electrode, sample conditioned measurement

### Measurement Range

0.1 - 200 mg/l (0.1 - 200 ppm)

### Temperature Range

0° - 50°C (32° - 120°F) Measuring

### Cycle Response Time

3, 6, 12 or 30 minutes, user selectable

### Accuracy

± 100 ppb or 5 % of reading, whichever is greater

### Repeatability

± 2 % of reading

### Operating Conditions

Temperature: 10° - 50°C

Humidity: 5 to 95% noncondensing humidity

### Calibration Standards

1 ppm Fluoride

10 ppm Fluoride

### Reagents

TISAB

### Calibration Standards

1 ppm Fluoride

10 ppm Fluoride

### Hydraulic Connections

Sample Inlet: 1/8" ID tubing barb fitting

Drain Outlet: 1/4" ID tubing barb Fitting

### Power Requirement

100/240 Vac, 50/60 Hz, switch selectable

### Data Logging

Configurable Data Recording, Storage, and Output

### Analog output

Four 4-20 mA outputs

### Alarms

4 configurable relays SPDT 15A 250VAC

### Connections

2 x 4-20 mA, Line Neutral and Ground for Power

All connections are to a terminal strip, Access through IP65 1/2" cable glands

### Enclosure

Gray hot-molded fiberglass reinforced polyester transparent polycarbonate cover with non-metallic hinges. NEMA 4X, Protection degree IP65

### Mounting

Wall mounting or with optional bench support

### Operating temperature

5-50°C

### Cabinet

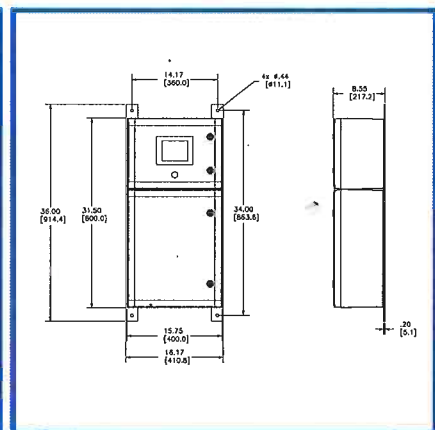
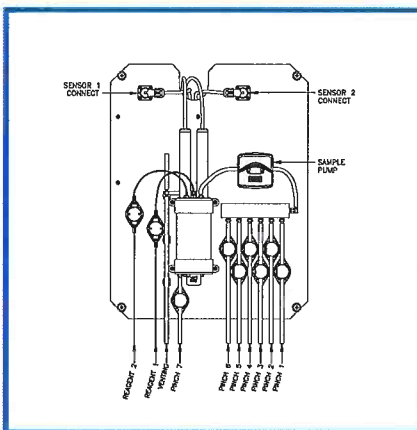
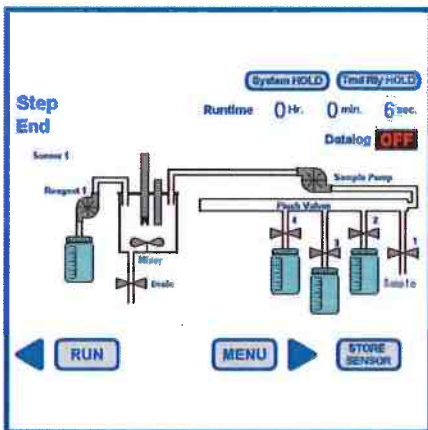
Non Metallic

### Dimensions

17" L x 32" H x 9" D (43cm x 81cm x 23cm)

### Weight

Approx. 30 lbs (14 kg)



Specifications subject to change without notice

### Represented by:

<p><b>Electro-Chemical Devices</b>          1500 North Kellogg Dr.          Anaheim, California, USA 92807          Phone: +1-714-695-0051          +1-800-729-1333          Fax: +1-714-695-0057          email: sales@ecdi.com          web: www.ecdi.com</p>	
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